

WHAT IS CLAIMED IS:

1. A compressed data processing method for reducing a picture updating frequency of a stream of picture data sets expressing respective compression-encoded
5 pictures, said stream including picture data sets each containing prediction information expressing a compression-encoded picture as being predictively encoded with respect to a predetermined corresponding other one of said compression-encoded pictures as a
10 reference picture, the method comprising steps of:
 preparing beforehand a copy data set whose contents indicate a compression-encoded picture as being identical to said corresponding reference picture, and
15 processing said stream of picture data sets to insert said copy data set to replace said prediction information in each of periodically occurring ones of said predictively encoded compression-encoded pictures.
- 20 2. The method according to claim 1, wherein said stream is an MPEG compressed video data stream in which each of said reference pictures is an I-picture or a P-picture and each of said predictively encoded pictures is a P-picture or a B-picture, each of said pictures
25 for which prediction information is replaced is a B-

picture, and wherein said copy data set includes motion
vector information indicating that an overall amount of
picture motion of a B-picture with respect to a
corresponding temporally preceding reference picture or
5 with respect to a corresponding temporally succeeding
reference picture is zero and motion compensated
prediction error information indicating that respective
amounts of motion compensated prediction error for all
macroblocks of said B-picture are zero, to thereby
10 specify all macroblocks of said B-picture as being
skipped macroblocks.

3. The method according to claim 1, wherein said
stream is an MPEG compressed video data stream in which
15 each of said reference pictures is an I-picture or a P-
picture and each of said predictively encoded pictures
is a P-picture or a B-picture, each of said pictures
for which prediction information is replaced is a P-
picture, and wherein said copy data set includes motion
20 vector information indicating that an overall amount of
picture motion of a P-picture with respect to a
corresponding temporally preceding reference picture is
zero and motion compensated prediction error
information indicating that respective amounts of
25 motion compensated prediction error for all macroblocks

of said P-picture are zero to, thereby specify all macroblocks of said P-picture as being skipped macroblocks.

- 5 4. The method according to claim 1, wherein said compressed video data stream is an MPEG data stream in which each of said reference pictures is an I-picture or a P-picture and each of said predictively encoded pictures is a P-picture or a B-picture, wherein a B-
- 10 picture copy data set and a P-picture copy data set are respectively prepared beforehand, wherein said B-picture copy data set includes motion vector information indicating that an overall amount of motion of a B-picture with respect to a corresponding
- 15 temporally preceding reference picture or with respect to a corresponding temporally succeeding reference picture is zero and prediction error information indicating that respective amounts of motion compensated prediction error for all macroblocks of
- 20 said B-picture are zero, to thereby specify all macroblocks of said B-picture as being skipped macroblocks, wherein said P-picture copy data set includes motion vector information indicating that an overall amount of motion of a P-picture with respect to
- 25 a corresponding temporally preceding reference picture

is zero and information indicating that respective amounts of motion compensated prediction error for all macroblocks of said P-picture are zero, to thereby specify all macroblocks of said P-picture as being
5 skipped macroblocks, and wherein a first processing mode or a second processing mode can be selectively established such that in said first processing mode each of the B-pictures of said MPEG compressed video data stream is replaced by said B-picture copy data set
10 and in said second processing mode, each of said B-pictures of said MPEG compressed video data stream is replaced by said B-picture copy data set and each of said P-pictures of said MPEG compressed video data stream is replaced by said P-picture copy data set.

15

5. A compressed data processing method for processing a selected part of an MPEG compressed video data stream to produce successive overall picture displacement in a predetermined direction for a final
20 displayed picture corresponding to said selected part, said selected part being formed of a continuous sequence of predictively encoded pictures, the method comprising steps of:

preparing beforehand copy information which
25 specifies one specific predictive encoding direction

for a predictively encoded picture and contains
information indicating a specific non-zero magnitude of
a motion vector which applies to all macroblocks of
said predictively encoded picture, and a specific
5 direction of said motion vector, and information
indicating that each macroblock of said predictively
encoded picture has zero amount of motion compensated
prediction error; and

processing each of said predictively encoded
10 pictures in said selected part of the MPEG data stream
to replace all motion vector information and motion
compensated prediction error information of said each
predictively encoded pictures with said copy
information.

15

6. The method according to claim 5, wherein said
selected part of the MPEG data stream contains a
plurality of I-pictures, and wherein said method
further comprises a step of processing each of
20 respective I-pictures which occur within said selected
part of the MPEG data stream to produce a specific
amount of displacement of a final displayed picture
corresponding to said I-picture, with said amount of
displacement being a continuation of successive amounts
25 of final displayed picture displacement which are

respectively produced as an effect of predictively encoded pictures which precede said each I-picture within a temporal sequence of the MPEG data stream.

5 7. A compressed data processing method for processing a selected part of an MPEG compressed video data stream to produce successive overall picture displacement in a predetermined direction for a final displayed picture corresponding to said selected part,
10 said selected part being formed of a continuous succession of B-pictures and P-pictures, the method comprising steps of:

 preparing beforehand a P-picture copy data set which includes motion vector information for specifying
15 a non-zero value of magnitude and a direction of a motion vector expressing an overall amount and direction of motion of a P-picture with respect to a corresponding temporally preceding reference picture, said copy data set further including motion compensated
20 prediction error information which specifies zero amount of motion compensated prediction error for all macroblocks constituting said P-picture;

 preparing beforehand a B-picture copy data set which includes motion vector information for specifying
25 a non-zero value of magnitude and a direction of a

motion vector expressing an overall amount and direction of motion of a B-picture with respect to a corresponding temporally preceding reference picture, said copy data set further including motion compensated
5 prediction error information which specifies zero amount of motion compensated prediction error for all macroblocks constituting said B-picture; and,

processing each of respective P-pictures in said selected part of the MPEG data stream to replace all
10 motion vector information and motion compensated prediction error information of said each P-picture with said P-picture copy data set, and processing each of respective B-pictures expressed in said selected part of the MPEG data stream to replace all motion
15 vector information and motion compensated prediction error information of said each B-picture with said B-picture copy data set.

8. The method according to claim 7, wherein said
20 selected part of the MPEG data stream contains a plurality of I-pictures, and wherein said method further comprises a step of processing each of respective I-pictures which occur within said selected part of the MPEG data stream to produce a specific
25 amount of displacement of a final displayed picture

corresponding to said I-picture, with said amount of displacement being a continuation of successive identical amounts of final displayed picture displacement which are respectively produced as an effect of B-pictures and P-pictures which precede said each I-picture within a temporal sequence of the MPEG data stream.

9. A compressed data processing apparatus for reducing a picture updating frequency of a stream of picture data sets expressing respective compression-encoded pictures, said stream including picture data sets each containing prediction information expressing a compression-encoded picture as being predictively encoded with respect to a predetermined corresponding other one of said compression-encoded pictures as a reference picture, the apparatus comprising:

stream buffer memory means for receiving, temporarily storing, and outputting successive portions of said compressed video data stream,

copy data memory means having stored therein a copy data set containing information indicating that a predictively encoded picture is identical to a corresponding reference picture,

picture data detection means for detecting a condition in which a set of data expressing a predictively encoded picture is currently held in said stream buffer memory means, and

5 data changeover means responsive to said detection for replacing all prediction information of said predictively encoded picture with said copy data set.

10. A compressed data processing apparatus for
10 reducing a picture updating frequency of an MPEG compressed video data stream, comprising
stream buffer memory means for receiving, temporarily storing, and outputting successive portions of said compressed video data stream,

15 copy data memory means having stored therein a B-picture copy data set containing information indicating that an overall amount of motion of an MPEG B-picture with respect to a preceding reference picture or with respect to a succeeding reference picture, expressed by
20 a motion vector, is zero and information indicating that respective amounts of motion compensated prediction error for all macroblocks of said B-picture are zero,

picture data detection means for detecting a
25 condition in which a set of data expressing a B-picture

of said compressed video data stream is currently held in said stream buffer memory means, and

data changeover means responsive to said detection of B-picture data set being held in said stream buffer memory means for replacing all motion vector information and motion compensated prediction error information of said B-picture data set with said B-picture copy data set.

11. A compressed data processing apparatus for reducing a picture updating frequency of an MPEG compressed video data stream, comprising

stream buffer memory means for receiving, temporarily storing, and outputting successive portions of said compressed video data stream,

copy data memory means having stored therein a P-picture copy data set containing information indicating that an overall amount of motion of an MPEG P-picture with respect to a reference picture, expressed by a motion vector, is zero and information indicating that respective amounts of motion compensated prediction error for all macroblocks of said P-picture are zero,

picture data detection means for detecting a condition in which a set of data expressing a P-picture

of said compressed video data stream is currently held
in said stream buffer memory means, and

data changeover means responsive to said detection
of a P-picture data set being held in said stream

5 buffer memory means for replacing all motion vector
information and motion compensated prediction error
information of said P-picture data set with said P-
picture copy data set.

10 12. A compressed data processing apparatus for
reducing a picture updating frequency of an MPEG
compressed video data stream, comprising

stream buffer memory means for receiving,
temporarily storing, and outputting successive portions
15 of said compressed video data stream,

copy data memory means having stored therein a P-
picture copy data set containing information indicating
that an overall amount of motion of an MPEG P-picture
with respect to a temporally preceding reference
20 picture, expressed by a motion vector, is zero and
information indicating that respective amounts of
motion compensated prediction error for all macroblocks
of said P-picture are zero, and a B-picture copy data
set containing information indicating that an overall
25 amount of motion of an MPEG B-picture with respect to a

temporally preceding reference picture, expressed by a motion vector, is zero and information indicating that respective amounts of motion compensated prediction error for all macroblocks of said B-picture are zero,

5 picture data detection means for detecting a condition in which a set of data expressing a P-picture or in which a set of data expressing a B-picture of said compressed video data stream is currently held in said stream buffer memory means, and

10 data changeover means controllable for selectively operating in a first mode whereby said data changeover means is responsive to said detection of a B-picture data set being held in said stream buffer memory means for replacing all motion vector information and motion
15 compensated prediction error information of said B-picture data set with said B-picture copy data set and in a second mode whereby said data changeover means is responsive to said detection of a B-picture data set being held in said stream buffer memory means for
20 replacing all motion vector information and motion compensated prediction error information of said B-picture data set with said B-picture copy data set and is responsive to said detection of a P-picture data set being held in said stream buffer memory means for
25 replacing all motion vector information and motion

compensated prediction error information of said P-picture data set with said P-picture copy data set.

13. A compressed data processing apparatus for
5 processing a selected part of an MPEG data stream to
produce successive displacement in a predetermined
direction for a final displayed picture corresponding
to said selected part, the apparatus comprising:
- stream buffer memory means for receiving,
10 temporarily storing, and outputting successive portions
of said compressed video data stream,
 - first memory means having stored therein a P-
picture copy data set which includes motion vector
information which specifies a non-zero magnitude and a
15 direction for a motion vector expressing an overall
amount and direction of motion of a P-picture with
respect to a temporally preceding reference picture,
said copy data set further including motion compensated
prediction error information which specifies zero
20 amount of motion compensated prediction error for all
macroblocks constituting said P-picture;
 - second memory means having stored therein a B-
picture copy data set which includes motion vector
information which specifies a non-zero magnitude and a
25 direction for a motion vector expressing an overall

amount and direction of motion of a B-picture with respect to a temporally preceding reference picture, said copy data set further including motion compensated prediction error information which specifies zero
5 amount of motion compensated prediction error for all macroblocks constituting said B-picture; and,

picture data detection means for detecting a condition in which a set of data expressing a P-picture or in which a set of data expressing a B-picture within
10 said selected part of the compressed video data stream is currently held in said stream buffer memory means, and

data changeover means responsive to said detection of a B-picture data set being held in said stream
15 buffer memory means for reading out said B-picture copy data set from said first memory means and responsive to said detection of a P-picture data set being held in said stream buffer memory means for reading out said P-picture copy data set from said second memory means and
20 replacing all motion vector information and motion compensated prediction error information of said P-picture data set with said P-picture copy data set.

14. The apparatus according to claim 13, wherein said
25 selected part of the MPEG data stream contains a

plurality of I-pictures, and wherein said apparatus further comprises means for processing each of respective I-pictures which occur within said selected part of the MPEG data stream to produce a specific
5 amount of displacement of a final displayed picture corresponding to said I-picture, with said amount of displacement being a continuation of successive amounts of overall picture displacement which are respectively produced as an effect of B-pictures and P-pictures
10 which precede said each I-picture within said selected part of the MPEG data stream.

15. A recording and playback system for compressed data, comprising:

15 a recording medium;
recording means for generating a recording signal to record on said recording medium a plurality of program items expressed as respective streams of compressed digital data, each of said streams formed of
20 successive picture data sets expressing respective compression-encoded pictures, and including picture data sets each containing prediction information expressing a compression-encoded picture as being predictively encoded with respect to a predetermined

corresponding other one of said compression-encoded pictures as a reference picture;

playback means for playback of selected ones of said program items from said recording medium;

5 recording information means for acquiring respective recording information relating to said program items from said recording signal and for holding said recording information;

means for designating one of said recorded program
10 items to be subjected to picture updating frequency reduction processing;

program item specifying means for obtaining recording information relating to said designated program item from said recording information means, and
15 for controlling said playback means in accordance with said recording information to read out the recorded data of said program item from said recording medium as a compressed playback data stream;

and a compressed data processing apparatus
20 coupled to receive said compressed playback data of a designated program item and process said playback data to obtain a processed MPEG video data stream, and supply said processed MPEG video data stream to said recording means to be recorded on said recording

medium, said compressed data processing apparatus comprising

stream buffer memory means for receiving,
temporarily storing, and outputting successive portions
5 of said compressed video data stream,

copy data memory means having stored therein a
copy data set containing information indicating that a
predictively encoded picture is identical to a
corresponding reference picture,

10 picture data detection means for detecting a
condition in which a set of data expressing a
predictively encoded picture is currently held in said
stream buffer memory means, and

data changeover means responsive to said detection
15 for replacing all prediction information of said
predictively encoded picture with said copy data set.

16. The apparatus according to claim 15, wherein each
of said streams of compressed digital data is an MPEG
20 compressed video data stream, and wherein

said copy data memory means has stored therein a
B-picture copy data set containing information
indicating that an overall amount of motion of an MPEG
B-picture with respect to a preceding reference picture
25 or with respect to a succeeding reference picture,

expressed by a motion vector, is zero and information indicating that respective amounts of motion compensated prediction error for all macroblocks of said B-picture are zero,

5 said picture data detection means detects a condition in which a set of data expressing a B-picture of said compressed video data stream is currently held in said stream buffer memory means, and

10 said data changeover means is responsive to said detection of a B-picture data set being held in said stream buffer memory means for replacing all motion vector information and motion compensated prediction error information of said B-picture data set with said B-picture copy data set.

15

17. The apparatus according to claim 15, wherein each of said streams of encoded data is an MPEG compressed video data stream, and wherein

20 said copy data memory means has stored therein a P-picture copy data set containing motion vector information indicating that an overall amount of motion of an MPEG P-picture with respect to a corresponding temporally preceding reference picture is zero and information indicating that respective amounts of
25 motion compensated prediction error for all macroblocks

of said P-picture are zero, and a B-picture copy data set containing motion vector information indicating that an overall amount of motion of an MPEG B-picture with respect to a corresponding temporally preceding reference picture or with respect to a corresponding temporally succeeding reference picture is zero and information indicating that respective amounts of motion compensated prediction error for all macroblocks of said B-picture are zero,

10 said picture data detection means comprises means for detecting a condition in which a set of data expressing a P-picture or in which a set of data expressing a B-picture of said compressed video data stream is currently held in said stream buffer memory means, and

15 said data changeover means is controllable for selectively operating in a first mode whereby said data changeover means is responsive to said detection of a B-picture data set being held in said stream buffer memory means for replacing all motion vector information and motion compensated prediction error information of said B-picture data set with said B-picture copy data set and in a second mode whereby said data changeover means is responsive to said detection of a B-picture data set being held in said stream

buffer memory means for replacing all motion vector information and motion compensated prediction error information of said B-picture data set with said B-picture copy data set and is responsive to said
5 detection of a P-picture data set being held in said stream buffer memory means for replacing all motion vector information and motion compensated prediction error information of said P-picture data set with said
10 P-picture copy data set.

10

15

20

25